## **APPENDIX C**

### **Field Forms**

- C-1. Groundwater Purge Log
- C-2. Vapor Purge Log
- C-3. Kirtland AFB, BFF Spill, Monthly Water Level Field Measurements Form
- C-4. Visual Classification of Soils Form
- C-5. Monitoring Well Completion Diagram
- C-6. Soil Vapor Monitoring Well Construction Diagram
- C-7. Well Development Record
- C-8. Well Abandonment Form
- C-9. Example Completed Chain-of-Custody Form
- C-10. Sample Collection Log

## Form C-1. Groundwater Purge Log



# GROUNDWATER PURGE LOG

Kirtland Air Force Base, Bulk Fuels Facility Spill Project Name: \_ Well ID No.: Site / SWMU No.: Date: \_\_\_\_ Weather: Time: \_\_\_ Field Crew: Crew Signature: Review Signature: Date Review: \_\_\_ WELL OBSERVATIONS Protective Casing / Vault: - Intact - Damaged -Locked: Yes - No Well ID Mark: Yes - No Notes: CALCULATIONS (A) Depth to Well Bottom ft (J) Filter Pack Volume (H x I) gal (B) Pre-Purge Depth to Water ft (K) Min Purge Volume (E + J) gal (C) Water Column Height (A-B) ft EQUIPMENT / MODEL ID NUMBER (D) Casing Factor: 4"=0.65 5"=1.02 Parameter Meter (E) One Well Casing Volume (C x D): gal (F) Depth to Top of Screen ft Turbidity Meter (G) Depth to Bottom of Screen ft (H) Saturated Filter Pack Length Pump (G -F, or B) ft (I) Casing/Borehole Factor Field Alkalinity 4/10 = 1.2, 5/10 = 1.07,PURGING INFORMATION Description first water purged: Date Depth to Spec Gallons Temp pН DO ORP Turbidity and / or Ground-Cond Comment Removed (NTU) (mg/L) (mV) (°C) Time water (Ft)  $(\mu S/cm^2)$ Values Prior to Sampling Field Alkalinity Result Note: For calculations, additional casing factors (D) and casing/borehole factors (I) can be found in the Groundwater Investigation Work Plan, Part I: Field Investigation Activities

# Form C-2. Vapor Purge Log



# Shaw Environmental, Inc. VAPOR PURGE LOG Rase, Bulk Fuels Fa Kirtland Air Force Base, Bulk Fuels Facility Spill

Project Nam	oject Name: Well ID N				Field Crew:		
Site / SWML	J No.:	Date:			Crew Signatu	re:	-
Weather:		Time:			Review Signa	ture and Date	:
			ELL OBSER	VATIONS	S		
Protective Control Notes:	asing / Vault: Intact	- Damaged	Locked	: Yes - No	We	ell ID Mark: Ye	es - No
			CALCULAT	TIONS			
	Well Bottom		ft	(F) Filter Pa	ck Length (E –D)		ft
(B) Casing Fa .0218, 3" = .0	ector: ½" = .00136, ¾" 04906	= .00306, 2" =	ft²	7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5	Borehole Factor: g at 30% porosity	10.000.000.000	0.1635 ft <sup>2</sup>
(C) One Well	Casing Volume (A x B	):	ft <sup>3</sup>	(J) Filter Pa	ck Volume (F x G	)	ft <sup>:</sup>
(D) Depth to	Top of Screen	10.	ft	(K) One Pur	ge Volume (C + J	)	ft
(E) Depth to	Bottom of Screen		ft	(L) 10 Purge	Volumes (K*10	)	ft
Static Press	ure:			Purge Flov	v Rate:		
Date/Time	Volume Purged (ft³)	СО	Horiba Me	xa – 584 L O <sub>2</sub>	НС	Comments	
		(%)	(%)	(%)	(ppmv)		
	2						12.00
	to Sampling						
Values Prior	, 0						
Values Prior			. 1				

Sample ID:

# Form C-3. Kirtland AFB, BFF Spill, Monthly Water Level Field Measurements Form

KIRTLAND AIR FORCE BASE, BULK FUELS FACILITY SPILL, MONTHLY WATER LEVEL FIELD MEASUREMENTS

MONITORING WELL ID	PUMP	COMPLETION	MEASUREMENT DATE	DEPTH TO LNAPL (FBMP)	DEPTH TO WATER (FBMP)	DEPTH TO WATER BELOW STEEL CASING OR VAULT	DEPTH TO TAGGED BOTTOM (FBMP)	COMMENTS / NOTES
	_							
	_							

140705.BA010020

1 of 2

APPENDIX C

# Form C-4. Visual Classification of Soils Form



# **Visual Classification of Soils**

Shaw Environmental & Infrastructure, Inc.

Projec	ct Num	ber:			Project Name:							
Boring	g Numb	per:			Coordinates: GWL: Depth			Date:				
Eleva	tion:				Date/Time:		Da	Date Started:				
Engin	eer/Ge	ologist:			Depth	Date/Time:		Da	te Com	pleted:		
	g Meth							Pa	ge:	of		
				BESIDER RESIDEN								
Depth ( )	Sample Type & No.	Blows on Sampler per (	Recovery ( )	7	Description		USCS Symbol	Measured Consistency	(TSF) Well Construction			
										,		
									+			
						KI						
					2							
							-		+			
									_			
									_			
					12							
									_	,		
									+	,		
									_			
									_			
									_			
Notes	:											
Drillin	g Cont	ractor:										
Drillin	g Equi	pment:										
Driller	:											
									15 15 15			

Form Number: 252\_2 Rev. 05-12-09

## Form C-4. Visual Classification of Soils Form (concluded)

# Consistency of Cohesive Soils Unconfined Compressive Strength (Tons per Square Foot) Very Soft Less than 0.25 Soft 0.25 to 0.50 Firm 0.50 to 2.0 Hard 2.0 to 4.0 Very Hard More than 4.0

#### 

(1) Standard penetration resistance is the number of blows required to drive a 2-inch O.D. split barrel sampler 12 inches using a 1-pound hammer falling freely through 30 inches. The sampler is driven 18 inches and the number of blows recorded for each 6-inch interval. The summation of the final two intervals is the standard penetration resistance.

Cobbles	Gra	ivel		Sand		Silt and Clay
Cobbies	Coarse	Fine	Coarse	Medium	Fine	

#### USCS CLASSIFICATION FOR SOILS

#### Coarse-Grained Soils

#### Fine-Grained/Highly Organic Soils

	GW	Well-graded gravels, gravel-sand mixtures, little or no fines		
Clean Gravels (little or no fines)	GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines		
Gravel with Fines	GM	Silty gravels, gravel-sand-silt mixtures		
(appreciable amount of fines)				
Olean Canda	SW	Well-graded sands, gravelly sands, little or no fines		
Clean Sands (little or no fines)	SP	Poorly-graded sands, gravelly sands, little or no fines		
Condo with Fines	SM	Silty sands, sand-silt mixtures		
Sands with Fines (appreciable amount of fines)	sc	Clayey sands, sand-silt mixtures		

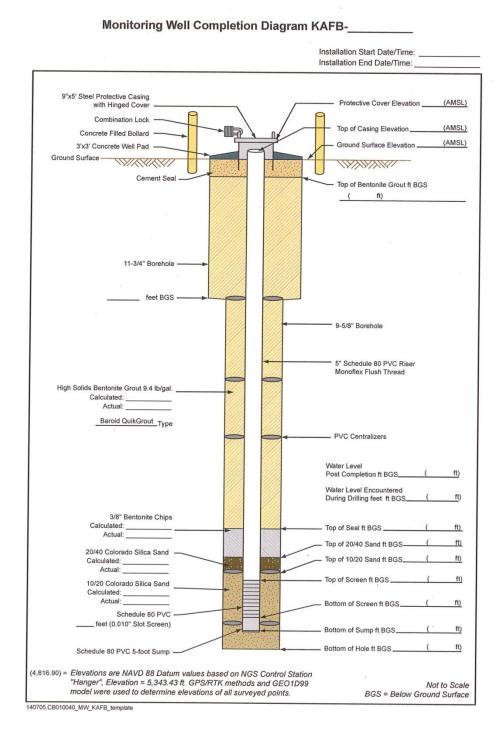
	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
Silts and Clays Liquid Limit (less than 50)	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
	OL	Organic silts and organic silty clays of low plasticity
	МН	Inorganic silts, micaceous or diatomaceous; fine, sandy or silty soils
Silts and Clays Liquid Limit (greater than 50)	СН	Inorganic clays or high plasticity, fat clays
	ОН	Organic clays of medium to high plasticity, organic silts
Highly Organic Soils	PT	Peat, humus, swamp soils with high organic contents

Form Number: 252\_2 Rev. 05-12-09

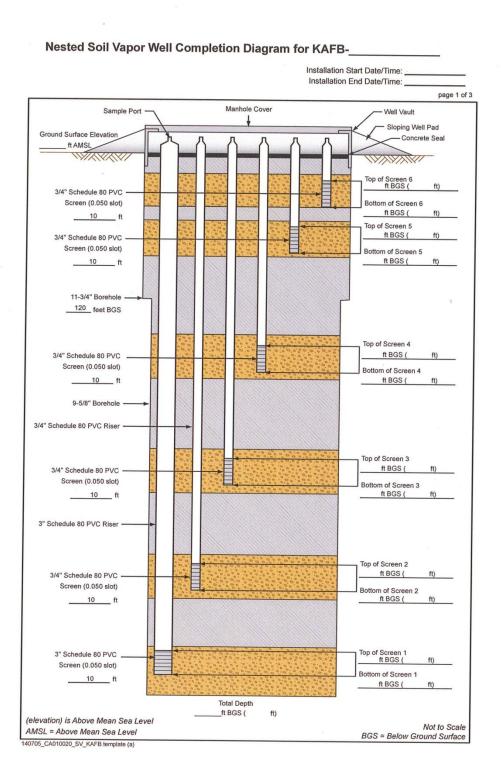
CLEAR SIEVE SIEVE OPENINGS NUMBERS

3 1-1/2" 3/4" 3/8" #4 #10 #40 #200

Form C-5. Monitoring Well Completion Diagram



Form C-6. Soil Vapor Monitoring Well Construction Diagram



# Form C-7. Well Development Record

Date Installed:   Csg. Diameter (I.D.):   mplers:   Total Depth (ft. BGL):   Total Depth (ft.				V	Vell Deve	lopme	ent Record	d	
Date Installed:	oject Nan	ne: KAFB B	FF		-				
te:	cation: K	AFB			-		Well/Piez. I	No.:	
Indicated by the property of t	rsonnel:				_		Date Instal	led:	
thod of Development:    Prespired     Prespired	te:				-		Csg. Diame	eter (I.D.):	
Pandershipment   Pand					1,000		Total Depth	1 (ft. BGL):	
pth to Water Before Developing Well:  Vol. (V) Purge Factor Volume to Purge  ight of Water Column:  yele * r_c * L_c * 7.48) + (B * (r_w r_c) * L_s * Ø_s * 7.48) =				☐ Pumpi	ing		☐ Other (State M	lethod)	
pth to Water Before Developing Well:  Vol. (V) Purge Factor Volume to Purge  ight of Water Column:  y=(B*rc**Lc**7.48)+(B*(rv*rc)**Ls**Øs**7.48)=  y=(B*rc**Lc**7.48)+(B*(rv*rc)**Ls**Øs**7.48)=  gallons  pth Purging From:  feet Time Purging Begins:  ather:  Screened Interval (ft BGL):  uipment Nos.: pH Meter:  EC Meter:  Turbidity Meter:  uipment Decontaminated Prior to Development: Y  scribe:  lected Sample of Water Added to Well: Y  N  Water  Level (ft.  Below Removed  Turbidity	iginal Development			☐ Redevelopment					
Vol. (V) Purge Factor Volume to Purge  Ight of Water Column: feet = gal.* =  V=(B * r_c* * L_c * 7.48)+(B * (r_w*r_c)* L_s * Ø_s * 7.48)= gallons  pth Purging From: feet	velopmer	nt Date:							
V=(B * r <sub>c</sub> * * L <sub>c</sub> * 7.48)+(B * (r <sub>w</sub> -r <sub>c</sub> )* * L <sub>s</sub> * Ø <sub>s</sub> * 7.48)=	oth to Wa	ter Before	Developing \	Well:					
ather: Screened Interval (ft BGL): sipment Nos.: pH Meter: EC Meter: Turbidity Meter: supment Decontaminated Prior to Development: Y N seribe: lected Sample of Water Added to Well: Y N scribe: lected Sample of Water Added lected Sample o	ight of W	ater Colum	ın:	feet =		_		o Purge	
ather: Screened Interval (ft BGL):  pripries     EC Meter: Turbidity Meter:								llons	
inipment Nos.: pH Meter: EC Meter: Turbidity Meter:  inipment Decontaminated Prior to Development: Y N  inipment Decontaminated Prior to Development: Y N  inipment Nos.: pH Meter: Turbidity Meter:	ather:								
Water   Level (ft.   Volume   Below   Removed   Turbidity	uipment N	Nos.: pH M	leter:	EC N					
Level (ft. Volume Below Removed Turbidity	scribe:						_		
Below Removed Turbidity				Volume					
Date Time TOC) (gal.) Temp. C pH EC (ms/cm) N.1.U. Comments	Data	Time	Below		T 00		FO ( ()		
	Date	Time	100)	(gai.)	Temp.*C	рн	EC (ms/cm)	N.T.U.	Comments
	$\overline{}$								
	-								
							-		
							+		
							Where:		
er Levels - Reported to the nearest 0.01 foot B=3.14									
	ter Levels - R						B=3.14 Ø.= porosity of th	e sand pack	
- Reading rounded to 0.1 pH units  Ø_≡ poresity of the sand pack ter temperature - Reported to nearest 0.1C  r_≡ radius of the well casing and screen in feet	- Reading rou ter temperatu	nded to 0.1 pH re - Reported to	units nearest 0.1C				$\varnothing_s$ = porosity of the $r_c$ = radius of the $v$	vell casing and screen	n in feet
- Reading rounded to 0.1 pH units Ø <sub>s</sub> = porosity of the sand pack	iter Levels - R - Reading rou iter temperatu	nded to 0.1 pH re - Reported to	units nearest 0.1C				Ø <sub>s</sub> = porosity of the r <sub>c</sub> = radius of the v L <sub>c</sub> = length of water	well casing and screen er column inside the c	n in feet casing and screen in feet

# Form C-7. Well Development Record (concluded)

			Well De	evelopr	nent Re	ecord		
Project:			_		Well No:_			<u> </u>
Project Nur	nber:	8	_		Samplers	i:		_
Date:			_		Checked	Ву:		_
Time Start:			-		Time Fini	sh:		_
Field Chemi	stry (cont'd)				Ti .			
Date	Time	Water Level (ft. Below TOC)	Volume Removed (gal.)	Temp.°C	рН	EC (ms/cm)	Turbidity N.T.U.	Comments
						, i	-	
			,					
	AS							
	-			30.00.00				
								E 9 E
					150			
Was well sa	mpled after	developmen	t? YES	NO				
Sample Met	nod:					-		
Sample Nam	ie:					_		
Analyses:								

Pg\_\_\_\_of\_\_\_

Form C-8. Well Abandonment Form

# Form C-9. Example Completed Chain-of-Custody Form



Project Number: 140705

Project Name: Kirtland AFB

# ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Lab Destination: Hall Environmental Analysis Laboratory

Samples Shipment Date: 24 MAR 2011

Reference Document No: 140705-IDW032

Bill To: Shaw Environmental, Inc. - Accounts P

Page 1 of 2

PO Box 98519

Baton Rouge

22.70

LA 70884

Sample Coordinator: Mark Lyon	Lab Contact: An	idy Freeman	Report To: Pamela I	Mana	
Tumaround Time: 10 day	Project Contact: Pa	mela Moss	• paper-parameter	chnology Way, Suite 300	
, , , , , , , , , , , , , , , , , , , ,	Carrier/Waybill No.: Co	ourier/N/A	Denver	CO 80237	7
Special Instructions: 10 day TAT					
Possible Hazard Indentification:  Non-hazard  Flammable  Skin Im	Radiologi itant Poison B Unkno		Disposal by Lab	Archive (	(mos.)
1. Relinquished By Kimberly To (Signature/Affiliation)	Date: 3/24/6	1. Received (Signature/Affilia		Time	3/24/4
Relinquished By     (Signature/Affiliation)	Date: Time:	2. Received (Signature/Affilia		Date: Time:	3/24/11
Relinquished By     (Signature/Affiliation)	Date: Time:	3. Received (Signature/Affilia		Date:	
Comments: 3 Rolloffs			V		
//03932					
Sample Sam No Sample Name Da	10.0	tr ty Preservative	Requested Testing Program	Sample Vol Units Fil CID	Condition On Receipt
106047IDW2 KAFB10647-SO-106047IDW2-REG 24 MAF	12011 14:16 8 oz CWM	None except cool to 4 C	TCLP Metals by SW846 1311 6010B, TCLP Mercury by SW846 1311 7470A	N	
706047IDW2 KAFB10647-SO-106047IDW2-REG 24 MAR	14:16 8 oz CWM	None except cool to 4 C	TCLP Pesticides by SW846 1311 8081B, TCLP Herbicides by SW846 1311 8151A, TCLP VOCs by SW846 1311 8260B, TCLP SVOCs by SW846 1311 8270D	N	``
106047IDW2 KAFB10647-SO-106047IDW2-REG 24 MAF	2011 14:16 8 oz CWM	1 None except cool to 4 C	Reactivity, Corresivity, and Ignitability	N	16
	14.16 8 02 CVVVI	T Notic except door to 4 o	by SW846 Chapter 7,7.3.4.2		. لا

# Form C-9. Example Completed Chain-of-Custody Form (concluded)

Shaw <sup>™</sup>
Shaw E & I, Inc.
1142 600-

# ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

227

Reference Document No: 140705-IDW032

Page 2 of 2

2	110	393Z									
	Sample No	Sample Name	Sample Date	Sample Time	Container		Preservative	Requested Testing Program	Sample Vol	Units Fil	Condition On Receipt
-2 -	106047IDW3	KAFB10647-SQ-106047IDW3-REG	24 MAR 2011	14:19	oz CVVM	1	None except cool to 4 C	by SW846 8021 TPH as Diesel by SW846 8015B, TPH as Gas0ac 808 SW846 8015B, BTEX		N	
	7060471DW3	KAFB10647-SO-108047IDW3-REG	24 MAR 2011			1	None except cool to 4 C	by SW846 8021 TCLP Metals by SW846 1311 6010B, TCLP Mercury by SW846 1311 7470A		N	
	1060471DW3	KAFB10647-SO-106047/DW3-REG KAFB10647-SO-106047/DW3-REG	24 MAR 2011	1 4	oz CWM			Reactivity, Corrosivity, and Ignitability by SW846 Chapter 7,7.3.4.2		N]	
	<b></b>	i	24 MAR 2011	<u>  1 1113  </u> 5	oz CWM	1		TCLP Pesticides by SW846 1311 8081B, TCLP Herbicides by SW846 1311 8151A, TCLP VOCs by SW846 1311 8260B, TCLP SVOCs by SW846 1311 8270D	ē	, N	
-30	106081IDW1	KAFB10681-SO-106081IDW1-REG	24 MAR 2011	14:13	oz CWM	1	None except cool to 4 C	TCLP Metals by SW846 1311 6010B, TCLP Mercury by SW846 1311 7470A		N.	
	1060811DW1	KAFB10681-SO-106081IDW1-REQ	24 MAR 2011	14:13	oz CWM	1	None except cool to 4 C	TCLP Pesticides by SW846 1311 8081B, TCLP Herbicides by SW846 1311 8151A, TCLP VOCs by SW846 1311 8260B, TCLP SVOCs by SW846 1311 8260B, TCLP SVOCs by SW846 1311 8270D		N	-
200	106081IDW1	KAFB10681-SO-106081IDW1-REG	24 MAR 2011	14:13	oz CWM	1	None except cool to 4 C	Reactivity, Corrosivity, and Ignitability by SW846 Chapter 7,7.3.4.2		N	
-34	106081 IDW1	KAF810681-SO-1060818DW1-REG	24 MAR 2011	14:13	oz CWM	1	None except cool to 4 C	TPH as Diesel by SW846 8015B, TPH as Gasoline by SW846 8015B, BTEX by SW846 8021		N	

# Form C-10. Sample Collection Log



haw E & I, Inc.	820017 · Kirtland AFB							
	Manager:							
Location Code:	RF FIELDOC	A / COC Number:						
Sample Number:	3. <del>7.</del>	Task: 140705-ARP2011-GW						
	FIELDQC-BW-GW8012-AB-AB	Collection Date:						
Sampling Method:		Collection Time:						
Sample Type:		Start Depth:						
Sampling Equip:	BW Sample Purpose: AB	End Depth:						
Partners:		Sample Matrix: WQ						
(TB)	(ER) (FB)	Sample Team:						
	Containers	ERPIMS Values:						
Analytical Suite SW8260B	Flt Frtn Qty Size Units Type	Sacode:						
SW8260B	N A 2 40 mL VOA VIAL	Lot Control#:						
Comments:								
		- 100 mm						
Sketch Locati	on:							
Logged BY /	Date:	Reviewed BY / Date:						